

Amendments to the Claims:

1-22 (Cancelled)

23. (Original) An array of discrete, microscopic particles that are initially in a substantially fixed spatial relationship with respect to each other and with respect to a matrix that acts as a host material for holding the particles, wherein:

each of said particles includes at least one atom, said array including at least first, second, and third ones of said particles; and

said particles are arranged to perform a logic computation, so that in response to at least one of said first and said second particles being urged into a lower potential energy state, movement of said third particle is induced as a result of at least one of i) physical interaction between said first particle and said third particle and ii) physical interaction between said second particle and said third particle.

24. (Original) The array of Claim 23, wherein movement of said third particle is induced as a result of i) physical interaction between said first particle and said third particle and ii) physical interaction between said second particle and said third particle, said array of discrete particles forming an AND gate.

25. (Original) The array of Claim 23, wherein said array of discrete particles forms an OR gate.

26. (Original) The array of Claim 23, wherein:

movement of said first particle is induced as a result of moving a fourth particle in said array, in which said fourth particle physically interacts with said first particle; and

movement of said second particle is induced as a result of moving a fifth particle in said array, in which said fifth particle physically interacts with said second particle.

27. (Original) The array of Claim 23, wherein said particles are molecules.

28. (Original) The array of Claim 27, wherein said molecules are arranged on a surface of said matrix.

29. (Original) The array of Claim 23, further comprising additional particles whose presence in said array acts to induce movement of said third particle more quickly than would occur in the absence of said additional particles.

30. (New) The array of Claim 23, wherein said particles are diatomic molecules.

31. (New) The array of Claim 23, wherein said particles include carbon monoxide molecules.

32. (New) The array of Claim 23, wherein not all of said particles move while the logic computation is performed.

33. (New) The array of Claim 23, wherein said third particle moves translationally across a surface of said matrix.

34. (New) The array of Claim 23, wherein said particles are arranged on a surface of said matrix, and wherein said particles hop from one site on said surface to an adjacent site on said surface.

35. (New) The array of Claim 23, wherein said array is configured so that motion of said particles represents information.

36. (New) The array of Claim 23, wherein movement of said third particle induces movement of other particles in said array in a sequential fashion.

37. (New) The array of Claim 23, wherein the chemical structure of said particles remains unaltered as they move.
38. (New) The array of Claim 23, said particles including molecular dimers.
39. (New) The array of Claim 23, said particles including molecular trimers.
40. (New) The array of Claim 23, said particles comprising input arms that provide respective inputs to said array.
41. (New) The array of Claim 23, wherein said array includes particles arranged in a fanout configuration.
42. (New) The array of Claim 23, wherein said array includes particles arranged in a crossover configuration.
43. (New) The array of Claim 23, wherein said particles can be positioned with a scanning tunneling microscope.